RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 51-16-11

Log Event A

Borehole Information

Farm : TX	**Tank :** TX-116	**Site Number :** 299-W15-162
N-Coord : 42,106	**W-Coord :** 75,765	**TOC Elevation :** 670.33
Water Level, ft :	**Date Drilled :** 11/30/1973	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
This borehole was drilled in November 1973 to a depth of 100 ft using 6-in. casing. The drilling log does not mention if the casing was perforated or grouted. Total logging depth achieved by the SGLS was 99 ft. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing. The zero reference for the SGLS logs is the top of the borehole casing. Although not mentioned on the Log Data Sheet, it is assumed that the top of the casing is flush with the ground surface.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 1/11/1996	**Logging Engineer:** Gary Lekvold
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 25.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 1/12/1996	**Logging Engineer:** Gary Lekvold
Start Depth, ft.: 99.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 24.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Log Event A

Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787 Analysis Date : 1/14/1997

Analysis Notes :

This borehole was logged in two log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. There was no gain drift during the logging activity. Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The only man-made radionuclide detected in this borehole was Cs-137. The presence of Cs-137 contamination was measured almost continuously from the ground surface to a depth of 29 ft, intermittently from 30.5 to 40.5 ft, and continuously from 97.5 ft to the bottom of the logged interval (99 ft). The maximum Cs-137 concentration was about 40 pCi/g at 3 ft.

The logs of the naturally occurring radionuclides show a pronounced increase in the K-40 concentrations below 48 ft. Below about 92 ft, the U-238 concentrations increase slightly and the Th-232 concentrations increase significantly.

Between 0.5 and 5 ft, it was not possible to identify the 609-keV peaks used to determine the U-238 concentrations. This occurred because high gamma-ray activity associated with the nearby Cs-137 peak (661 keV) created an elevated Compton continuum extending to the 609-keV region, causing the MDL to exceed the measured U-238 concentration.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks TX-113, TX-116, and TX-117.

Log Plot Notes:

Separate log plots show the man-made (Cs-137) and the naturally occurring radionuclides (KUT). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot of representative historical gross gamma-ray logs acquired between 1975 and 1994 is included. The data contained can be used to identify the approximate time period in which anomalous gamma-ray activity was recognized in the borehole and illustrate the approximate decay rate of short-lived radionuclides.